PRELIMINARY NOTE ON GAMETOGENESIS IN PHILOSAMIA CYNTHIA.

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Since the history of the chromosome groups has been so completely worked out in the spermatogenesis of insects, and the fact well established of an almost universal dimorphism in the spermatozoa, it has become increasingly important to study the conditions of maturation in the eggs of insects. It has been assumed that in insecta the eggs are all alike in the number and behavior of the chromosomes, and the recent observations of Morrill ('10) and others have shown this to be the case.

In studying the history of the male germ cells in the moth *Philosamia cynthia*, the writer found ('07) that the diploid chromosome groups are reduced to exactly similar haploid groups in the spermatocyte divisions. The same facts were determined by Stevens ('05) and Cook ('10) for various other Saturnidæ. Since no dimorphism was observed in the chromosome groups of the male, the possibility suggested itself that dimorphism might be found in the eggs. Large numbers of *cynthia* eggs were examined to determine the behavior of the chromosomes in maturation, with especial reference to the question of dimorphism. The results may be briefly stated as follows:

The number of chromosomes in the somatic cells is 26, which is also the spermatogonial number. The reduced number of chromosomes is found in the eggs just before they are laid. At this stage of late prophase, 13 chromosomes lie enclosed within the nuclear membrane, near the surface of the egg. The chromosomes are smooth, elliptical or dumb-bell-shaped bodies, well separated from one another. They show only slight differences in size and form. When arranged on the first polar spindle in anaphase, each of the dyad chromosomes separates into equal parts, which move to opposite poles of the spindle. In several hundreds of eggs examined, all the chromosome groups appeared similar. The chromosomes remaining in the egg are again halved

in the second division. Thus the two polar bodies receive groups exactly like that of the egg.

At the time of fusion of the germ nuclei, just before the nuclear walls break down, 13 chromosomes may be counted in the female pronucleus, 13 in the male pronucleus, this being the number found in the spermatocytes. By fusion of the two groups, the somatic number is obtained, which is found in the ensuing embryonic divisions.

Thus on the basis of observable differences in chromosomes, there is no indication of a nuclear dimorphism in the eggs, nor of the presence of idiochromosomes.

In the papers on spermatogenesis of Lepidoptera, above referred to, the writers describe a dumb-bell-shaped body, which is distinguished from the other chromosomes by its condensed form during growth. Later it becomes indistinguishable from the other chromosomes, and divides normally. This has been interpreted as an idiochromosome in which the *X* and *Y* elements are equal. Thus the Lepidoptera, as has been previously suggested, appear to belong in the same class with *Nezara*, which possesses an equal pair of idiochromosomes in the male. If the spermatozoa are to be considered dimorphic, it is necessary to assume a qualitative difference between *X* and *Y*. However the facts may be interpreted, there is no essential disagreement between gametogenesis in *cynthia* and in other insects in which no nuclear differences are observable.

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